

THE *STENOTREMA MONODON* GROUP OF
POLYGYRIDAE IN MICHIGAN

By PHIL L. MARSH

Of the *Polygyridae* which Pilsbry¹ has placed in the Group of *Stenotrema monodon* and Archer² has included in Section *Euchemotrema* of Genus *Stenotrema*, three forms are found in Michigan: *Stenotrema monodon* (Rackett), *S. fraternum* (Say) and *S. f. cavum* (Pilsbry and Vanatta). Each is abundant over a large area, and at least one occurs in every part of the state. The differences in the distributions of these three forms are very striking and are of considerable interest.

In Michigan there is very little difficulty in distinguishing between these three *Stenotremata*, and there is no other mollusc with which they may be confused. *S. fraternum* is nearly or entirely imperforate, while the other two have the umbilicus almost completely uncovered. The shell of *S. monodon* is usually darker and more glossy than those of the others, the whorls are more tightly coiled and the parietal denticle differs in being shorter and having its distal end slanting into the aperture. Archer² has pointed out that the basal sinus of the lip in *monodon* and its varieties is flattened or dished; in *fraternum* and its varieties this surface is convex. Of the three, *cavum* is the largest; the average diameter of a large number of Michigan specimens is 10.5 to 11.00 mm. The other umbilicate form, *monodon*, usually has a diameter of about 8.00 mm., rarely as much as 10 mm., often less than 7.00 mm.; *cavum*, then, is commonly about one-third larger than *monodon*, and colonies of either may be distinguished from the other at a glance. While the shells of *cavum* often seem somewhat more depressed than those of typical *fraternum*, measurement shows that this is not a constant or significant character; many specimens of the typical form have a smaller height/diameter ratio than the type of *cavum* as given by Pilsbry,¹ and topotypes received from J. B. Henderson from Cazenovia, N. Y. It is probable that in most

¹ Pilsbry, H. A., Land Mollusca of North America, 1940, Vol. I, Pt. 2, pp. 675-687.

² Archer, Allan F., NAUTILUS, 1939, 52: 98; 53: 33.

of our land shells the degree of elevation of individuals of a species depends on ecological rather than racial factors.

The ecological preferences of *monodon* and *fraternum* have been pointed out by several observers. *Monodon* is found in wet places; the flood plains of lakes and streams are favored sites, and it is often found in swamps. During the spring floods, large numbers of these shells may be found floating in a river or cast up on the shores, and in inundated lowlands the snails are found on hummocks or logs above the water. During the summer their favored home is under the debris left by the subsiding waters. *Fraternum*, on the other hand, is an inhabitant of the uplands, and in Michigan is found in almost any place that is not too wet: woodlands, pastures, roadsides, farmyards. It is one of the few species of the oak-covered glacial moraines of low fertility, where it is associated with *Triodopsis albolabris* (Say), *Anguispira alternata* (Say), *Zonitoides arboreus* and, sometimes, *Z. suppressus* (Say). *Cavum*, in its area of distribution, may be found not only in the uplands, but also along the streams, under drift on lake shores and in cedar bogs. While *monodon* and typical *fraternum* are rarely found together, *monodon* and *cavum* are more often associated.

For the mapping of the regions occupied by these snails in Michigan, few landmarks are needed. It will be remembered that Michigan is unique among the states in that it consists of two large land masses separated by water. The Upper, or Northern, Peninsula forms a long narrow triangle, extending some 350 miles eastward from the mainland of Wisconsin; its long north and south boundaries are formed by the waters of the Great Lakes. The Lower, or Southern, Peninsula extends northward from Ohio and Indiana, with Lake Huron separating it from Ontario on the east, and Lake Michigan separating it from Wisconsin on the west. Its shape, like that of a mitten, is familiar. On the east central shore is Saginaw Bay, separating the "thumb" from the fingers, with Bay City at the inner end of the bay. Jackson is about halfway between the east and west extremes of the peninsula, and is forty-five miles north of the Ohio boundary, or one-fifth of the way up the peninsula. Muskegon, on Lake Michigan on the west, is nearly opposite Bay City.

Stenotrema monodon is found over the entire Southern Peninsula. It is not entirely absent from the high, sandy "jack-pine region" of the north central part, and elsewhere in suitable habitats it is abundant. In the Northern Peninsula it has been found in Menominee County, in the extreme southwest part; presumably this is the result of invasion from Wisconsin. It is interesting that there is a thriving colony in Mackinaw City, on the south side of the Straits of Mackinac, while on the north side of the Straits, some six miles distant, it has not been found. It should be pointed out that from some areas of the central part of the Northern Peninsula there has been little collecting. In the eastern end, however, I have worked during parts of three summers, without finding this species.

Either *Stenotrema fraternum* or its variety *cavum* is found in every area of both peninsulas. The typical form, however, is found only in the most southern counties, while the northern part of the Southern Peninsula and the whole of the Northern Peninsula are occupied by *cavum*. If a somewhat irregular zone about twenty-five miles wide be imagined following a line drawn southwest from Bay City, at the end of Saginaw Bay, to Jackson, in the south central part of the state, and then turned northwest through Grand Rapids and Muskegon, it will be found that *fraternum* occurs only south of this zone, and *cavum* only north of it. Among hundreds of series in the Museum of Zoology, University of Michigan, and in my own collection, there is no exception to this. In the zone of separation both are found. Even here, each colony consists of one or the other, not both; only rarely have I found the two together.

Recently Pilsbry¹ has said of *cavum*, which he originally described with Vanatta, that he is "now inclined to think that its recognition as a subspecies is of little practical utility." Its definite geographical distribution in Michigan, combined with its recognizable characters, makes the retention of the name seem useful. It is a northern form, replacing typical *fraternum* not only in northern Michigan, but also in other northern areas with which I am familiar, such as Vermont, northern Wisconsin and Ontario, north of Lake Huron and in Peel County east of it. Further studies along the north boundary of the United States

are needed to establish the distribution outside of Michigan of these two forms.

MOLLUSCA OF CEDAR BREAKS NATIONAL MONUMENT, UTAH

BY WENDELL O. GREGG

During the Summer of 1935 it was my privilege to spend nearly three months at Cedar Breaks National Monument. This area is about 20 miles east of Cedar City, Utah. Here the Pink Cliffs, in some places exposed for a depth of nearly 2,000 feet, display a great variation of shades of color ranging from white or orange at the top to deep rose and coral. In contrast is the dark green of the heavily forested rim which attains an altitude of 10,400 feet. Though awed by the vastness of this spectacular beauty, my thoughts turned to the molluscan inhabitants which find shelter in these lofty forests of Engelmann spruce and alpine fir.

Though my collecting extended over the entire area, I collected most extensively in the region of "Sunset Point." Here the altitude was 10,000 feet. There was a moderate amount of moisture most of the time and but a few yards away a series of springs in a swampy meadow formed brooklets which were tributary to Long Valley Creek. All species listed except *Oreohelix strigosa depressa* (Cockerell) were found in the vicinity of "Sunset Point." *Oreohelix* was found in only one place at Cedar Breaks, along a steep wooded slope northwest of "Desert View."

The relative abundance of *Microphysula* was noticeable. The material collected here is referable to the Arizona subspecies, *Microphysula ingersolli meridionalis* Pilsbry and Ferriss. I had occasion to collect *Microphysula* from four other localities in southern Utah: Cedar Canyon, 10 miles from canyon mouth; southwest slope of Brian Head, Parawan Mts., at 11,000 feet altitude; head of Deep Creek, Kane County; and head of Mammoth Creek, Garfield County. These are all referable to *meridionalis*.

Many specimens of *Pupilla blandi* Morse were collected here, also from the following localities in southern Utah: head of Mammoth Creek; Zion National Park; head of Deep Creek; southwest